

## Remarks

By way of the foregoing amendments, the claims have been amended to delete reference numerals. In addition, a typographical error has been corrected in the specification.

Regarding the drawings, the box in Fig. 1 has been labeled with its functional name. Withdrawal of the objection to the drawings is requested.

The claims have been rejected as being unpatentable over Wright (US 3,732,438), Furukawa (JP 09129939A), Stelzer (DE 19928324 A1), Zeigler (US 6,317,303) Tidman (US 4,897,558) and/or Zoleta (US 3,835,369). Reconsideration and withdrawal of the art rejections is respectfully requested for at least the following reasons.

A switching element for modifying the electric resistance according to claim 1 comprises: (a) at least one high temperature superconductor, and (b) means for irradiating electromagnetic high frequency onto the at least one high temperature superconductor.

In the apparatus, switching is achieved not by irradiating electro-magnetic high frequency onto the superconductor but simply by switching off a **constant** magnetic field provided by the coil 6 (see in particular column 5, line 50+). The de-energization of the coil 6 causes the magnetic field to collapse. The paramagnetic salt, which is subjected to this constant magnetic field, exhibits a **magneto-caloric effect** which withdraws energy from its environment and reduces the temperature of the superconducting element so that it switches to the superconducting state and thus performs the switching action. As described in column 6, line 19+, the whole process is reversed when the current source connected to the coil is energized again to create the constant magnetic field in the paramagnetic salt.

In other words, Wright teaches to use a magneto-caloric effect of a paramagnetic salt to modify the temperature of a superconductor by means of turning on or off an external magnetic field. This is in contrast to the switching element of claim 1 which involves an entirely different concept, i.e. the use of electromagnetic **high frequency irradiated** onto the high temperature superconductor in order to trigger the switching.

It is noted that Wright does disclose use of his switch for creating a high-frequency chopper. This, however, has nothing to do with the use of high

frequency irradiation to causing a switching action. The high-frequency output of Wright's chopper is a consequence of the switch of Wright and **not a triggering means**.

As a result, Wright neither discloses nor suggests a switching element as set forth in claim 1, nor the method of claim 22.

The other references applied by the Examiner do not overcome the above-discussed deficiency of Wright as a teaching reference vis-a-vis the invention as set forth in claim 1. For instance, US 6,317,303 (Zeigler) does not disclose the irradiation with electro-magnetic high frequency. To the contrary, the switches disclosed in Zeigler relate to

- a thermo-type switch (cf. col. 2, lines 47 ff.) wherein the superconducting material is simply heated, or
- an injection of an overcurrent into the superconducting material (cf. column 2, lines 64 ff.), or
- magnetically actuated switches using an external coil for generating a high magnetic field normalizing the superconducting material (cf. column 3, lines 11 ff.), or
- the injection of a current with a very rapid rise time such as a high-frequency current (cf. column 3, lines 43 ff.).

None of these switches uses irradiation of electromagnetic frequency. In the last alternative, the high-frequency current is directly guided to a superconductor and causes a resistive heating in a normal wire extending in parallel to the superconductor and thereby switches the superconductor essentially by heating. Such an approach would not work with high-temperature superconductors, as they would simply fail if such an additional current pulse was supplied.

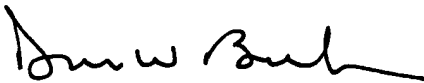
Therefore, Zeigler taken alone or with Wright can neither anticipate nor render obvious the subject matter of claims 1 or 22.

As a final matter, the Office is advised that the present specification is an accurate translation of the priority application, i.e. German Patent Application No. 10023547.6. Accordingly, DE 19928324 is not prior art.

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

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